Design and Deliver Great Mac OS X Games

Session 206

These are confidential sessions—please refrain from filming or taking pictures.

Graphics and Media

From “AAA” to Download and Play

Tim Schaaff

http://developer.apple.com/wwdc2005/

Product Line Is Hot

Customers Love the Cinema Display

Mac Sales Are Booming

Tiger: Our Biggest Cat

Apple Is Strong

CALL OF DUTY
UNITED OFFENSIVE
EXPANSION PACK

The SIMS 2

CLOSE COMBAT
FIRST TO FIGHT
UNITED STATES MARINES

STUBBS THE ZOMBIE™
IN Rebel Without a Pulse™

WORLD OF WARCRAFT

MYST V
END OF AGES

RISE OF NATIONS

DOOM 3

STAR WARS®
BATTLEFRONT™

#1 Category in our Retail Stores

Gaming on Mac OS X Is 133t!

$10B

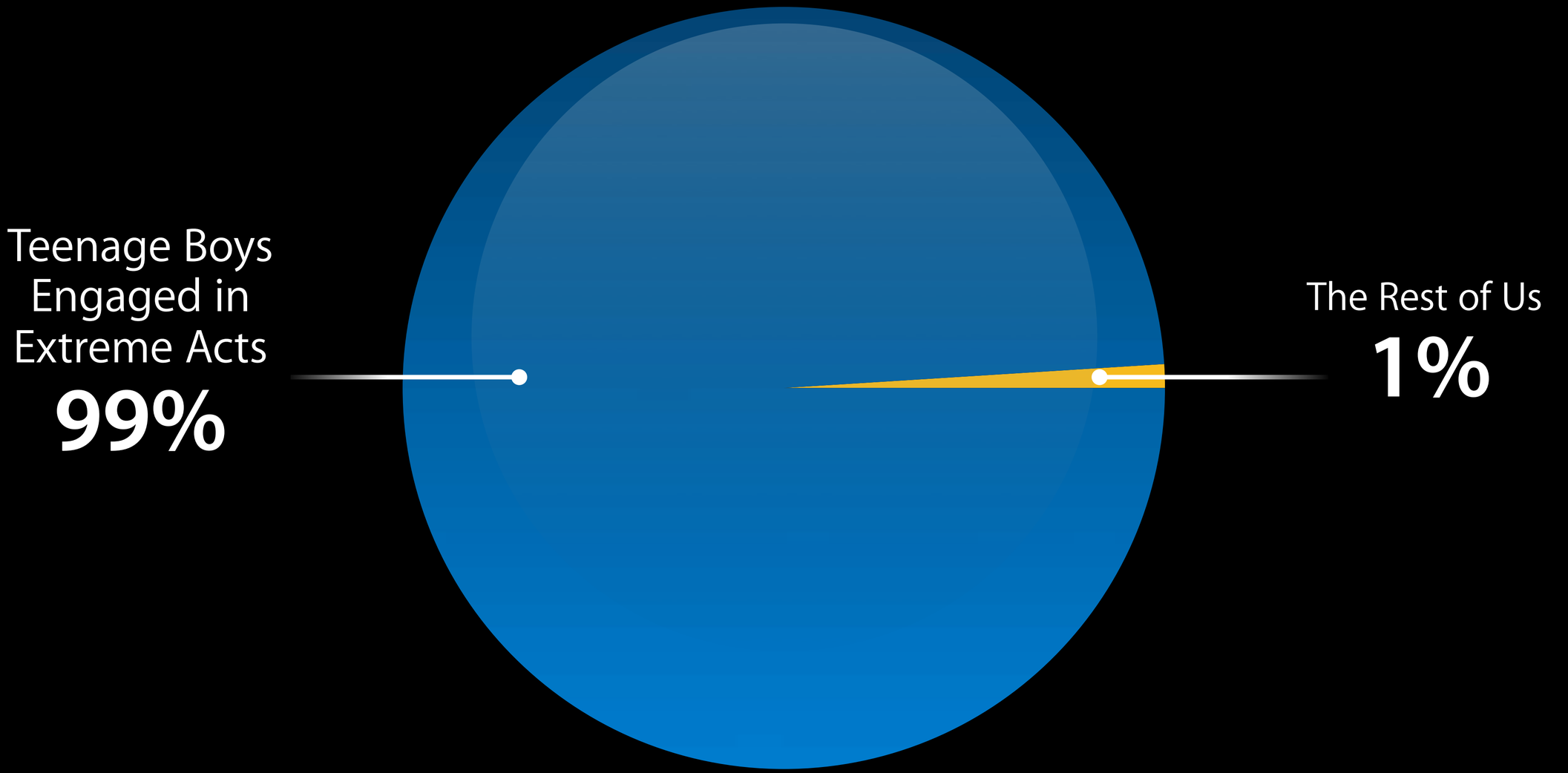
Gaming Goes “Big Business”

Business Starting to Work Like Hollywood

- Ultra high production values
  - Expensive talent, expensive graphics
- Large investment in proprietary technology
- “Big bang” launch marketing
- Hits become franchises
  - Don’t mess with the formula
- Huge upfront investment
  - Don’t miss Christmas!
- You become rich and famous!

Are We Serving the Whole Market?

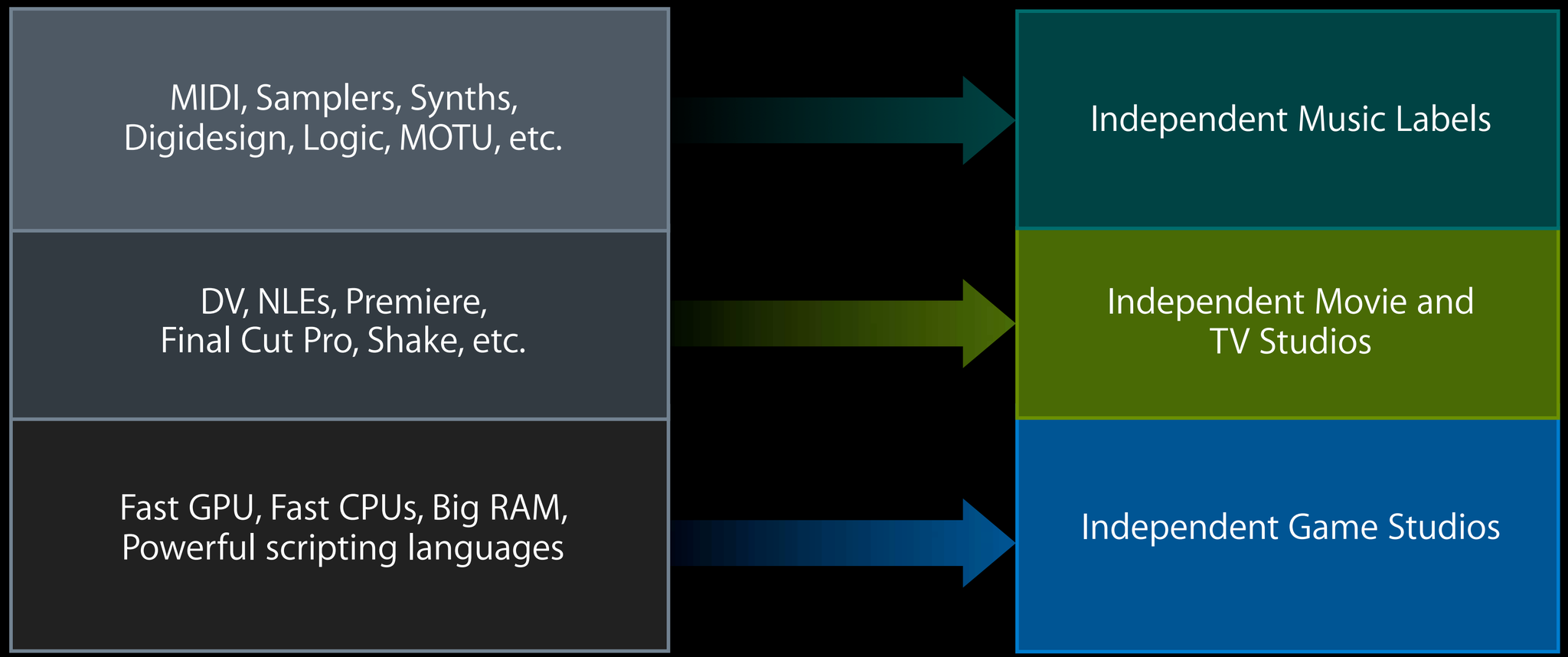
With a few notable exceptions…



There Is Another Way…

Declare Your Independence!

We've Been Here Before



Technology democratization creates huge new opportunities

Mac OS X Tiger

Putting Mac OS X Technology to Play

Peter Graffagnino
Senior Director
Graphics & Imaging Engineering

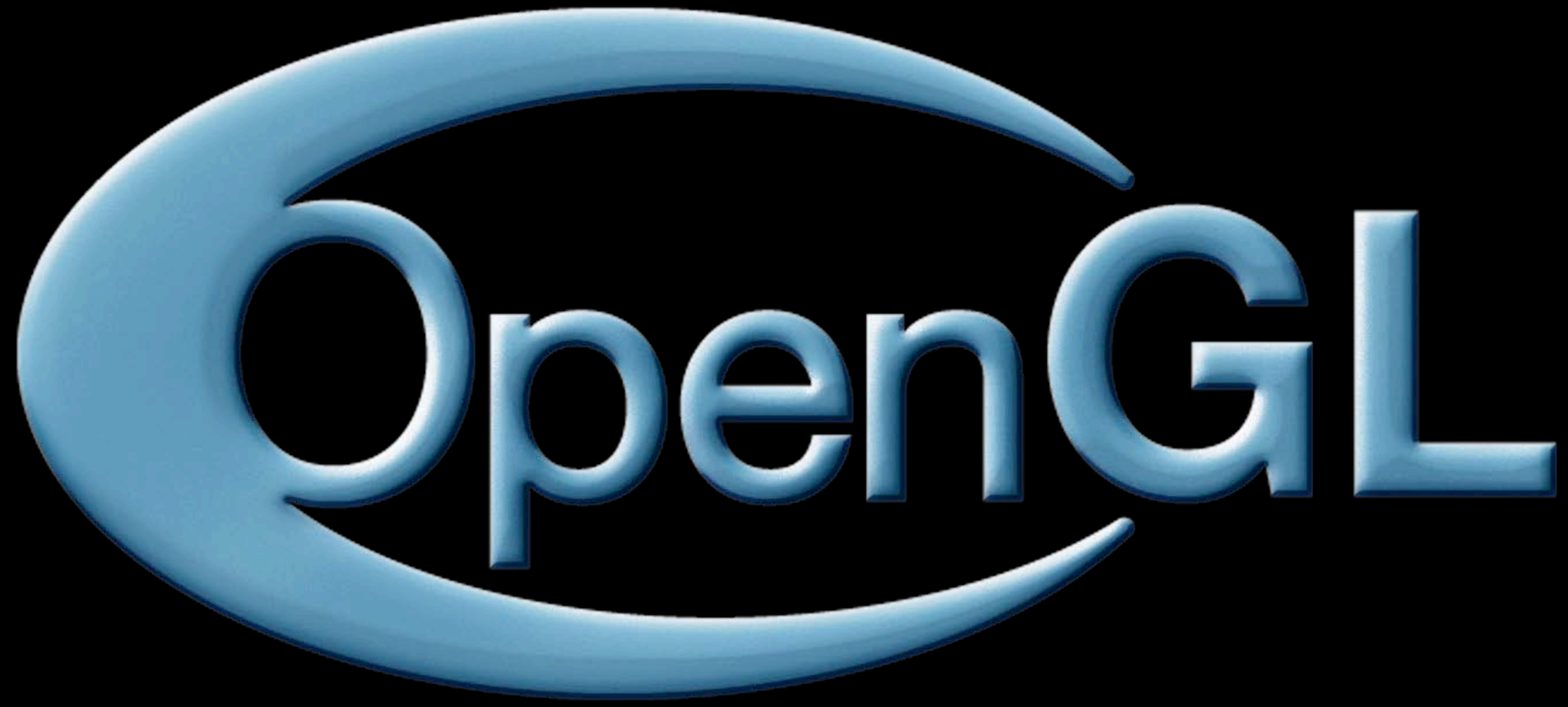
http://developer.apple.com/wwdc2005/

Key Points

- Great core technology and tools for games
- Development models
- Emerging trend: Game development platforms
- Simple best practices to enhance the gaming experience

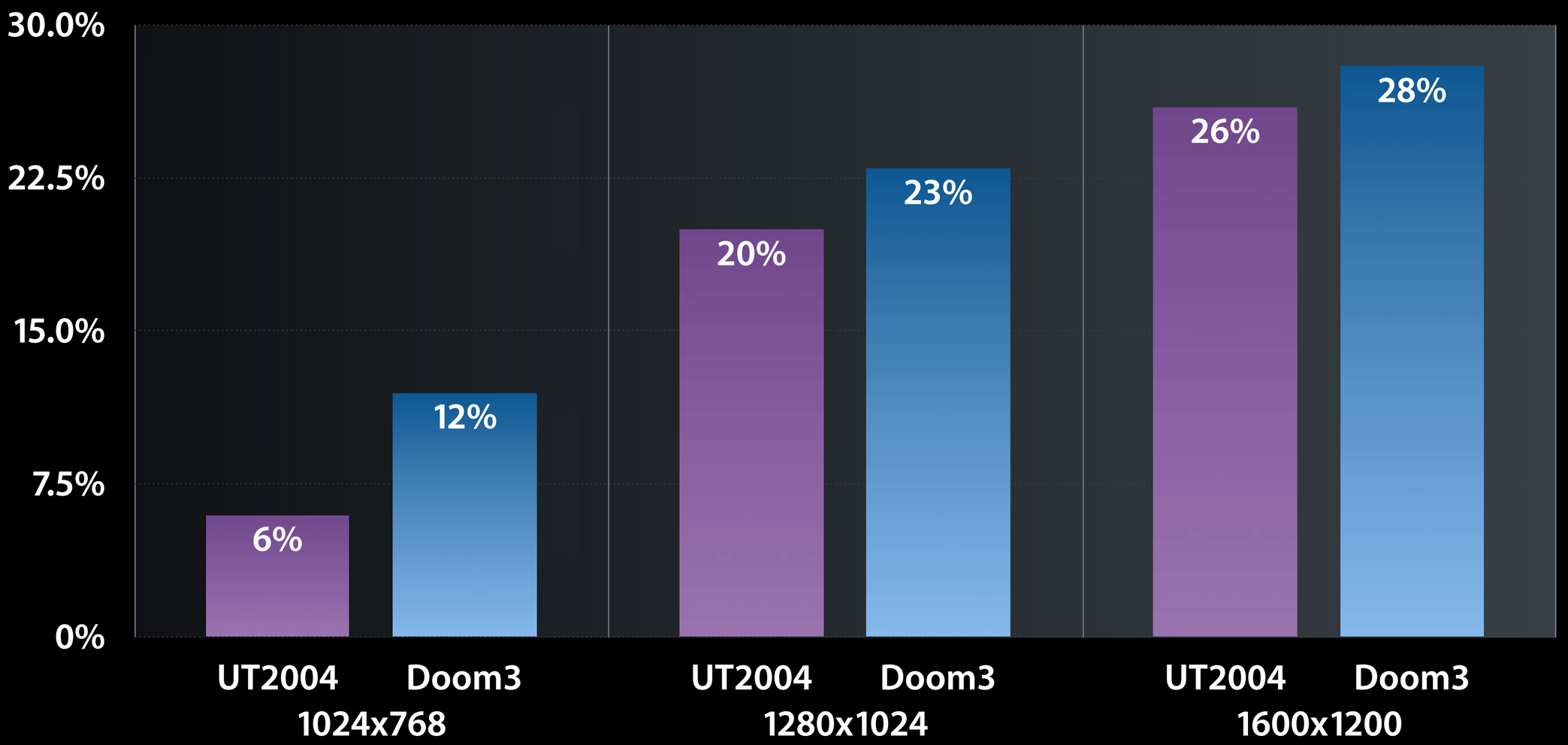
Game Technology Areas

Graphics	Sound	Input	Tools


OpenGL

OpenGL Performance: Panther vs. Tiger

Working with game developers to optimize performance



March 2001

Mac OS X 10.0

OpenGL 1.21

Sept. 2001

Mac OS X 10.1

OpenGL 1.3

32 Extensions

Aug. 2002

Mac OS X 10.2

OpenGL 1.3
65 Extensions
Quartz Extreme
FSAA

Oct. 2003

Mac OS X 10.3

OpenGL 1.4
85 Extensions
Vertex Programs
Fragment Programs
PBuffers

May 2005

Mac OS X 10.4

OpenGL 2.0

101 Extensions

OpenGL Shading Language

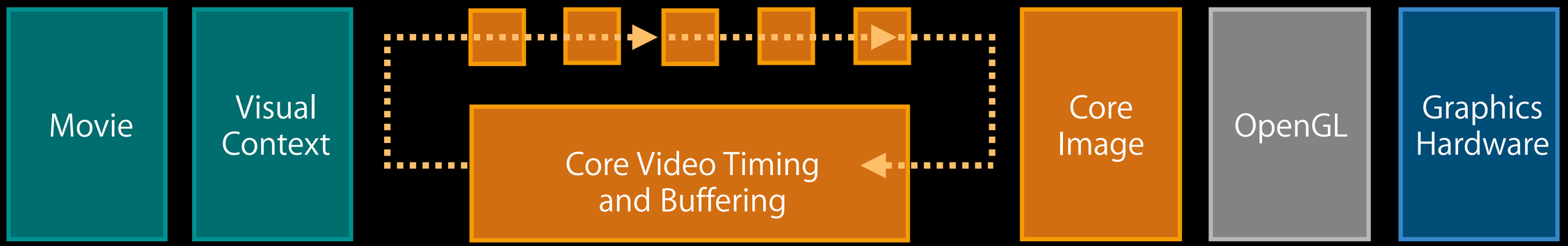
Mac OS X OpenGL Seeding Program

- Tighter feedback loop with you!
- Access prerelease versions of OpenGL and drivers
  - Active testing and feedback
  - Performance analysis
  - Bug regression
- Send request to openglseed@apple.com
  - Note: Space is limited

OpenGL Sessions and Labs

Maximizing OpenGL Performance	Session 214 Thursday 2:00PM
Maximizing Mac OS X OpenGL Lab	Tiger Lab Thursday 3:30PM
OpenGL & Quartz Composer Drop-in Lab	Graphics & Media Lab Friday 9:00AM

QuickTime 7 Is Easy to Use With OpenGL



H.264: High Def Quality Cut Scenes

More pixels for more compelling video

H.264: Incredible Quality Rendered Cut Scenes

State of the art codec maximizes quality

H.264: Incredible Quality Rendered Cut Scenes

State of the art codec maximizes quality

Compressed with H.264

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State of the art codec maximizes quality

Compressed with H.264

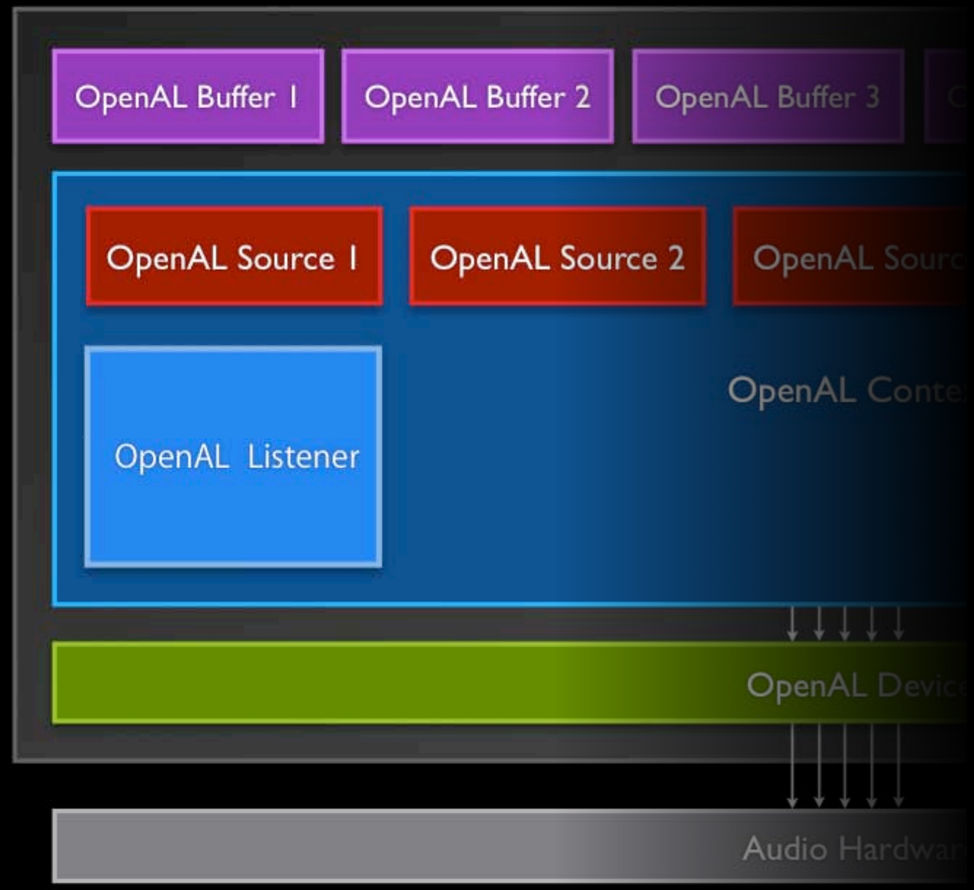
QuickTime 7 Sessions

High-Performance Video in Mac OS X Tiger	Session 207 Wednesday 10:30AM
Application Programming with QTKit	Session 211 Wednesday 3:30PM

OPENUAL

About OpenAL

- Powerful game-oriented audio API
  - 3D positional audio
  - Modeled after OpenGL
- Wide adoption in game community
  - Doom 3 for Mac
  - Close Combat: First to Fight
  - Star Wars Jedi Knight: Jedi Academy
  - Unreal Tournament 2004
  - Feeding Frenzy
  - A Tale in the Desert II
  - X-Plane
  - More…



USB HID

The standard for input

Craig Keithley
keithley@apple.com

Built-In Force Feedback Support

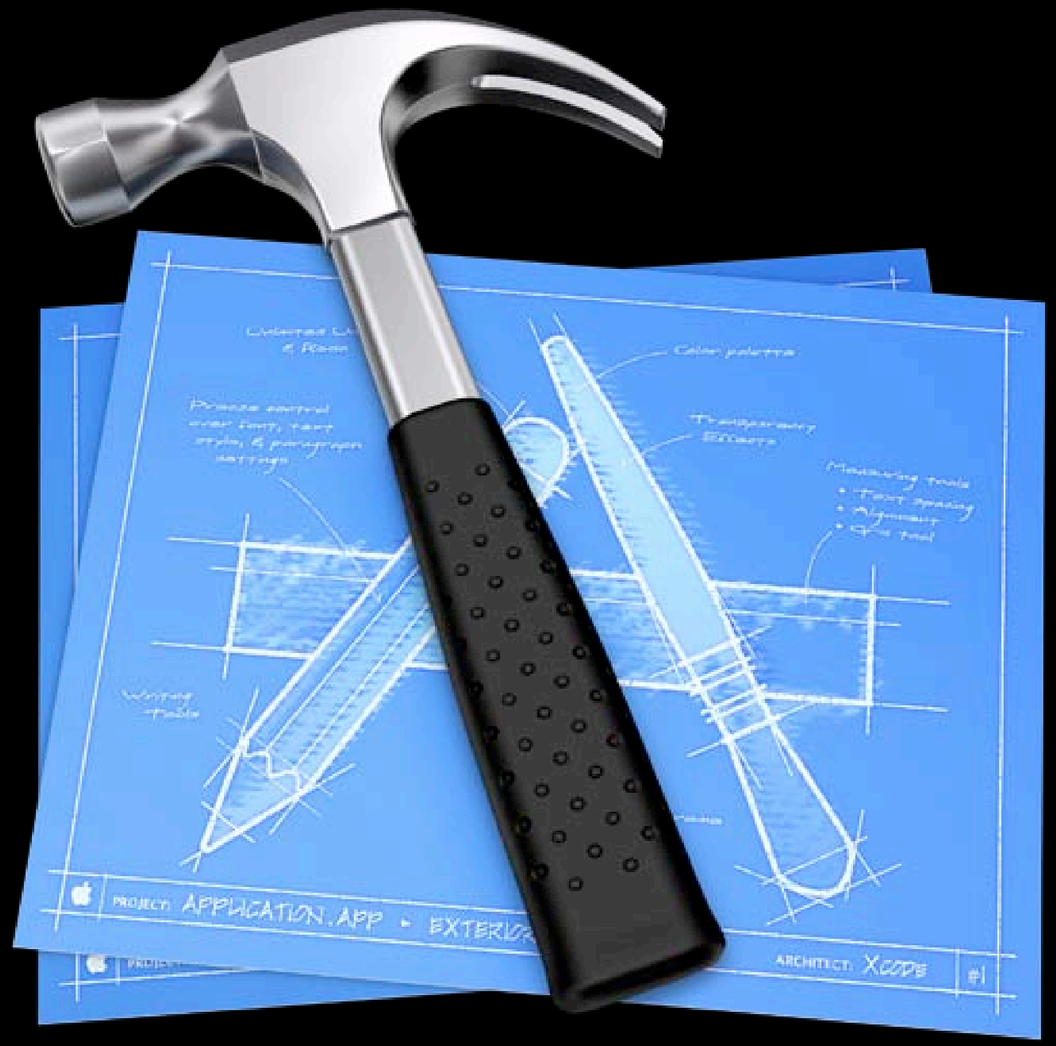
Immersion haptic framework in Mac OS X

FEEL THE GAME™

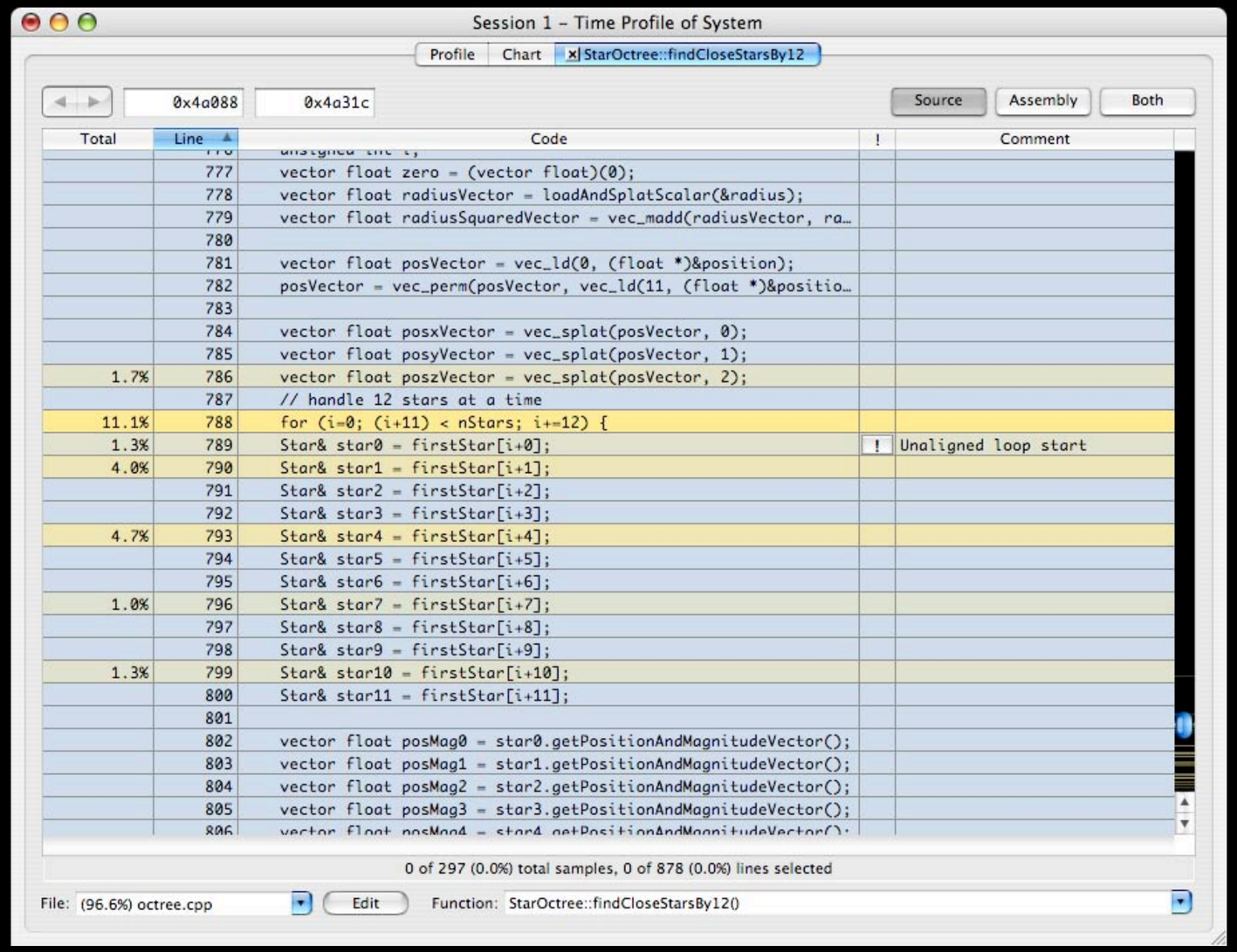
Immersion®

TouchSenseTechnology

Tools: Xcode


Color palette
Transparency
Measuring tools
PROJECT: APPLICATION.APP
ARCHITECT: XCODE
#1

Tools: Shark



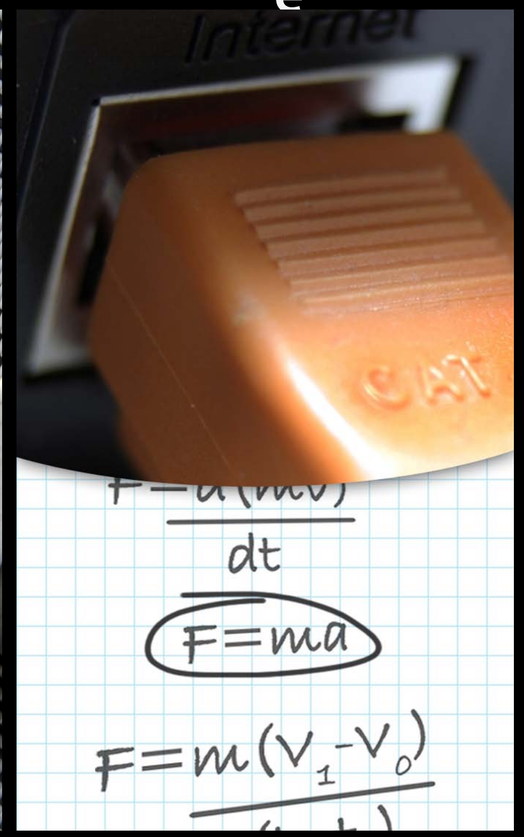
Swimming with Shark

Session 407
Friday 2:00PM

Tools: OpenGL Profiler

Game Technology Areas

Graphics	Sound	Input	Tools	Middleware



Ageia's NovodeX Physics Engine

- High performance solver
  - Incredible physics effects
  - Powerful simulation
- Multiprocessor aware
- Optimized for multiple platforms
  - PhysX PPU, Mac OS X, Linux, PC, and consoles
- Lunch talk today
- www.ageia.com

Game Networking

- GameRanger
  - Player matching and community
  - Sever browsing
  - Ladders, rankings, and buddy lists
  - Voice communication
  - CD/DVD key authentication
  - www.gameranger.com

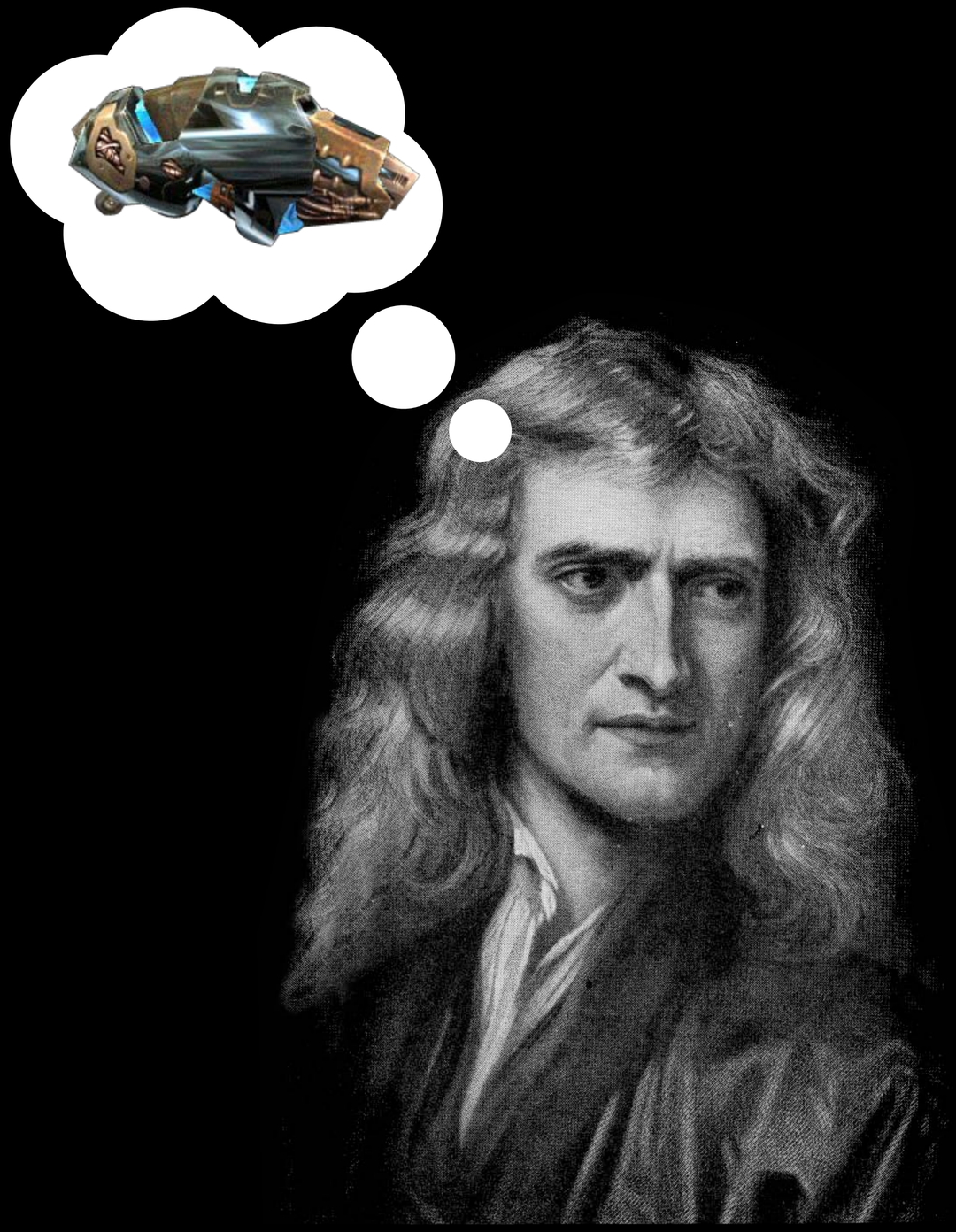
GameRanger Technologies
multiplayer online gaming services

- OpenPlay
  - Cross-platform multi-player network abstraction
  - Mac OS X, Windows, Linux, BSD, etc.
  - Project on www.sourceforge.net

SOURCEFORGE™ .net

Pathways to Game Development

http://developer.apple.com/wwdc2005/

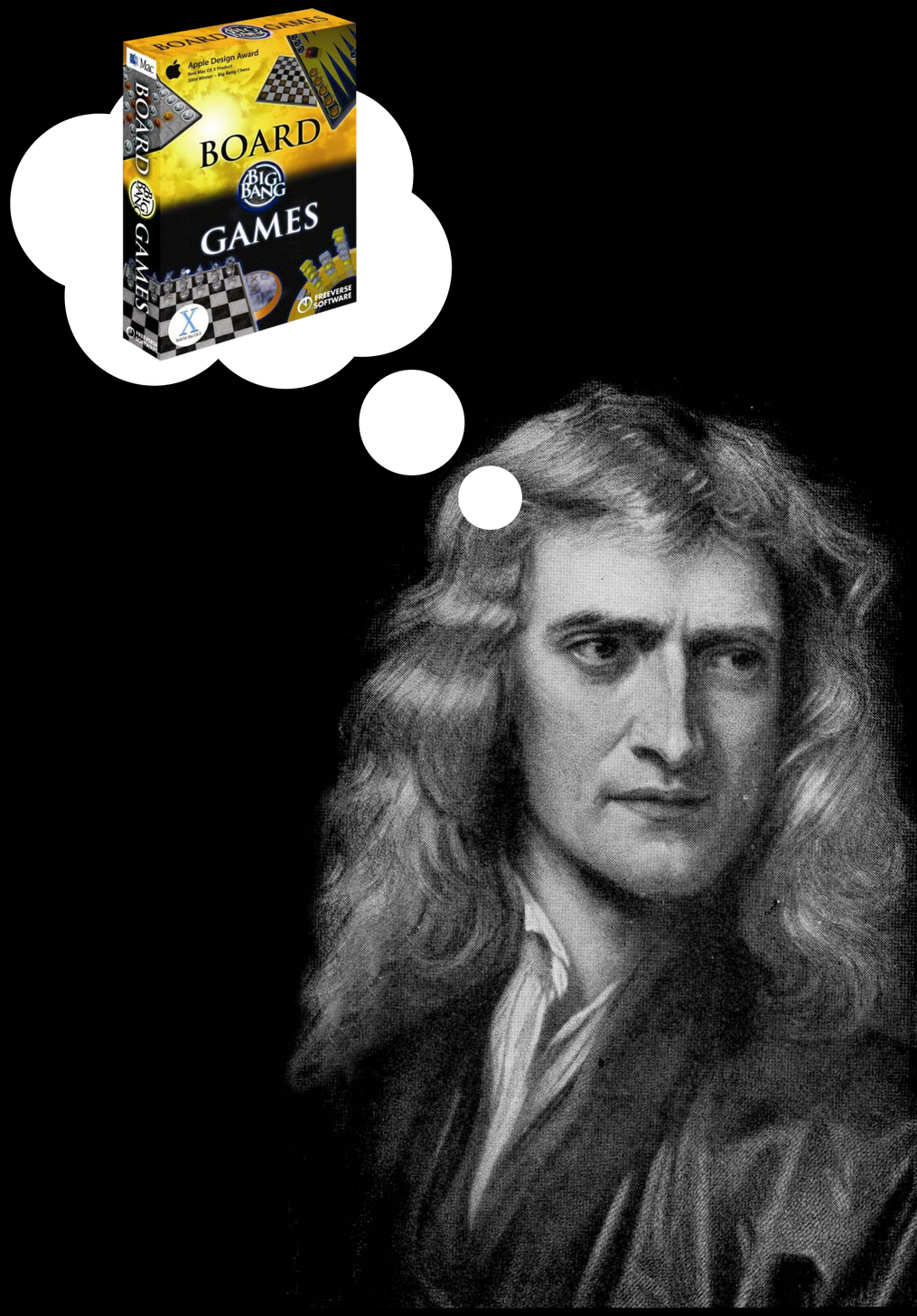


Top Tier Game Development

- Create game assets
  - Maya, MotionBuilder, PhotoShop
  - Final Cut Pro, Logic
- Directly leverage technology stack
  - OpenGL, OpenAL, etc.
- Build with Xcode
- Tune with Shark, OpenGL Profiler
- Create custom tools with Cocoa
  - Level editors
  - Art pipeline management
  - Technology demonstrators

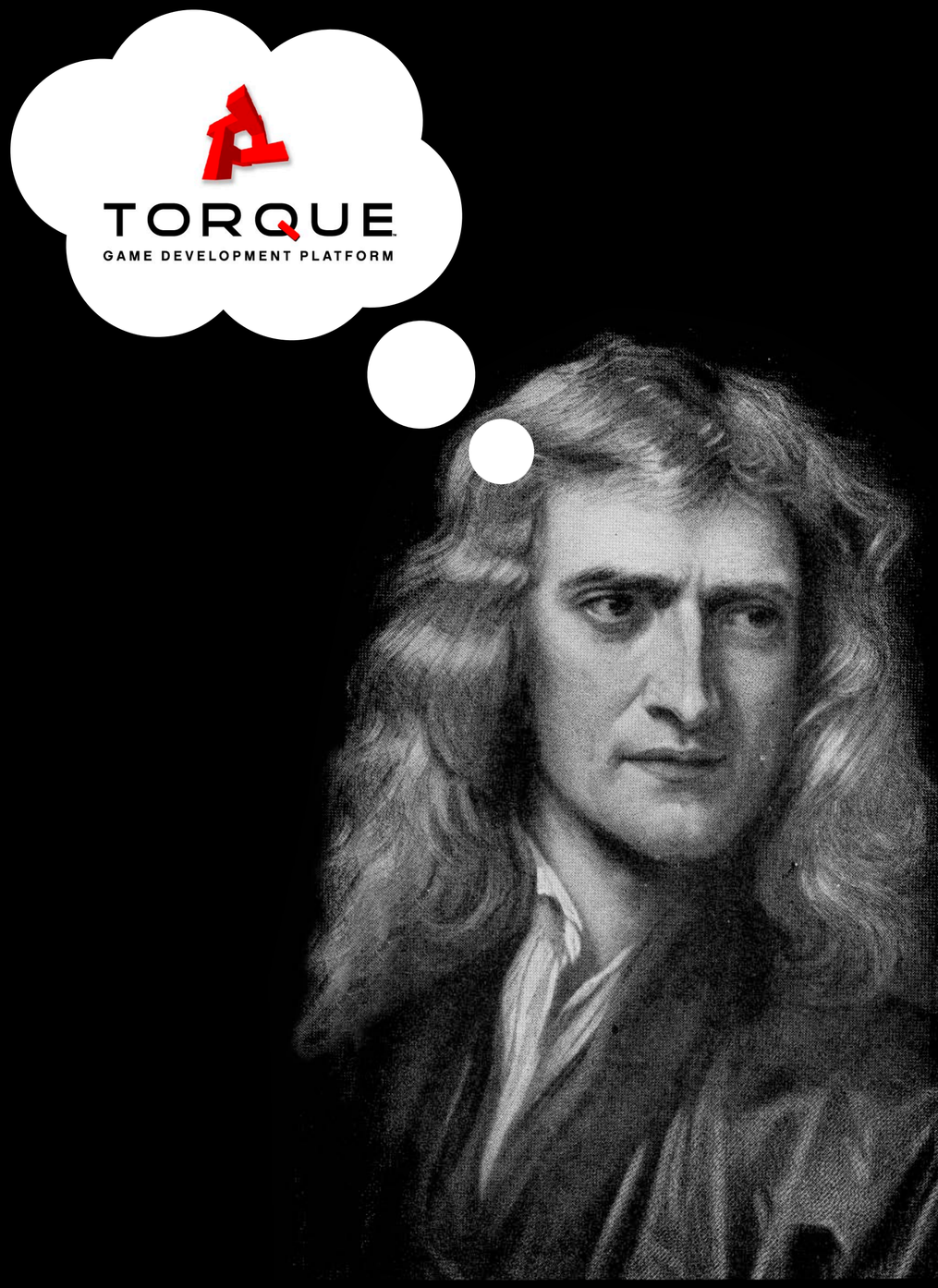
Top Tier Game Porting

- Create custom porting layers
- Directly leverage technology stack
  - OpenGL, OpenAL, etc.
- Build with Xcode
- Tune with Shark, OpenGL Profiler
- Examples
  - Aspyr
  - Critical Path
  - I5 Works
  - TransGaming
  - Trihedron
  - MacSoft



Mac-Only Game Development

- Ripe for experimentation
- Uniquely leverage Apple technologies
  - OpenGL, OpenAL
  - Quartz 2D, QuickTime, Core Image, Quartz Composer
  - iChat, iSight, .Mac
- Create using Cocoa for full platform access
- Tune with Shark, OpenGL Profiler
- Example
  - Freeverse's Big Bang Board Games



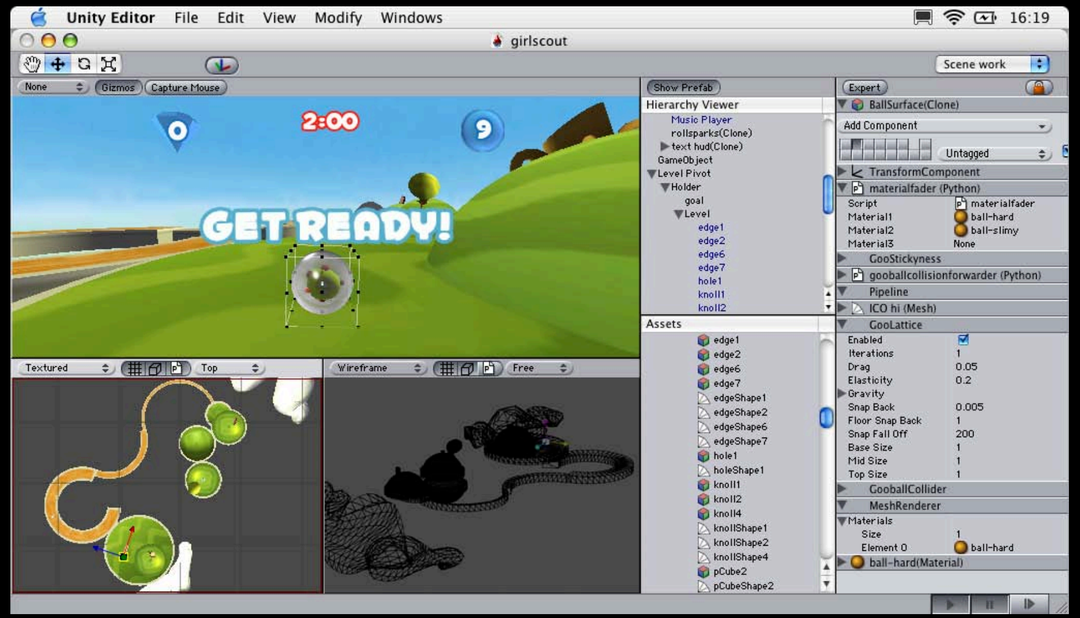
Downloadable Game Development

- Cross-platform for maximum reach
- Focus on game play, not technology
- Wide developer appeal
- Complete tool chains available for game development
  - Core game engine
  - Visual design tools
  - Scripting languages
- Emerging trend: Game development platform

otee

Unity Engine

- Announcing v1.0 shipping at WWDC
- Game engine and integrated editor
  - Create only on Mac OS X
  - Deploy to other platforms
- Publish as Dashboard Widget
- Powerful OpenGL-based 3D engine
  - Pixel shaders, Glow Effects, Particles
  - Built on NovadeX physics engine
  - Environmental audio via OpenAL
  - Works with popular content creation applications
- www.otee.dk



GooBall!

otee

AMBROSIA SOFTWARE INC

GarageGames®

Changing the way games are made and played

Tor que Game Development Platform

Jay Moore
Evangelist
GarageGames
www.garagegames.com

http://developer.apple.com/wwdc2005/

Torque Game Engine

- Complete game development platform
  - Full 3D engine based on OpenGL
    - Multi-pass texturing, volumetric fog, and per-vertex lighting effects
    - Skeletal animation, full particle system, and terrain support
  - Environmental audio via OpenAL
  - Multi-player networking support
  - Scripting and C++
  - World editor/level design tools
  - Full terrain editor
  - www.garagegames.com

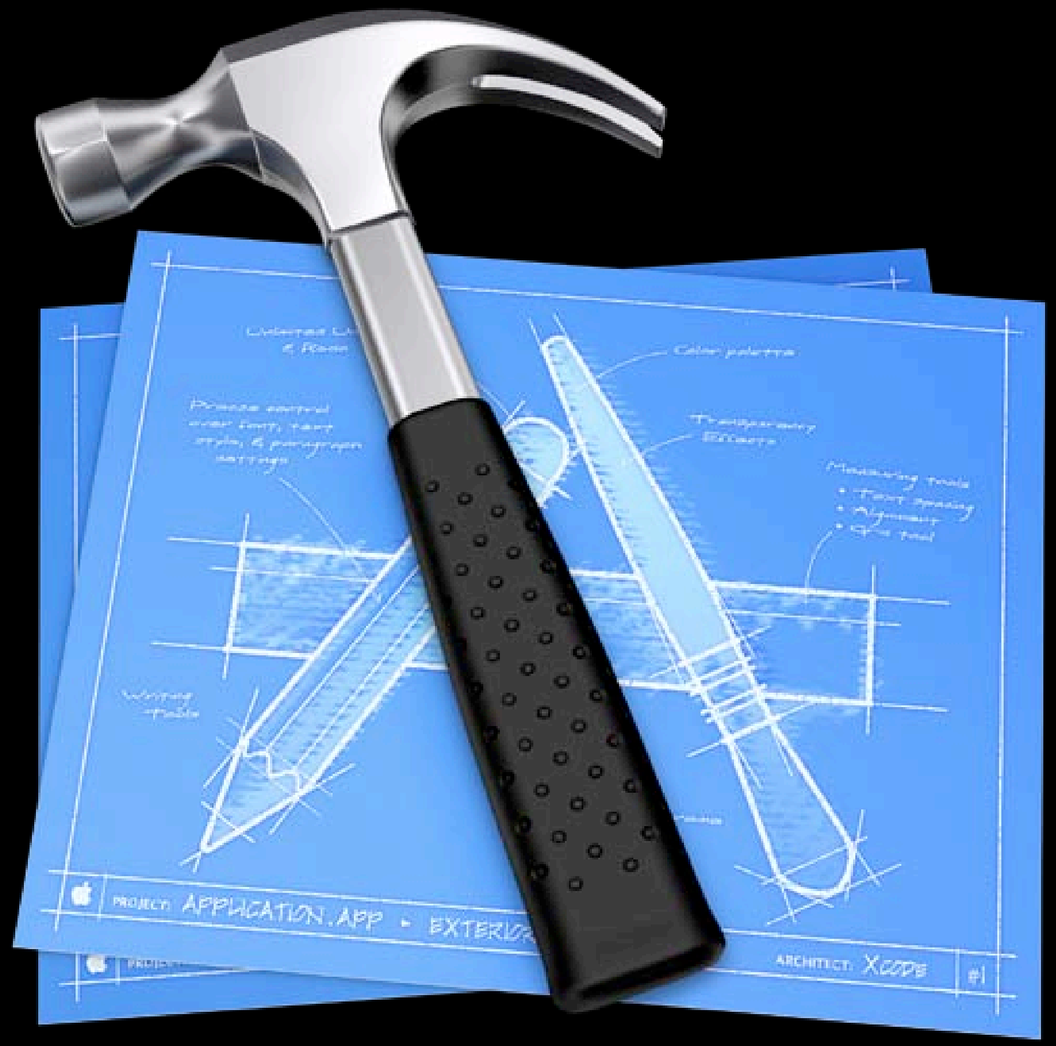
Demo

http://developer.apple.com/wwdc2005/

Mac OS X Game Best Practices

http://developer.apple.com/wwdc2005/

Use the Tools!



Support Our Displays at Native Resolution

Use Home Directories

- Don’t keep preferences and saves in the game folder
  - Very easy to “destroy” game saves during upgrades
  - What to back up?
- Put game saves in~/Documents
  - Double-clicking on saves should launch the game
- Put prefs and configuration files in
  - ~/Library/Preferences/
  - ~/Library/Application Support/<Company Name>
  - Use com.<Company Name>.game convention
- Check for compatibility with Fast User Switching

Package Your Application

README.TXT

TMKTPK04

MGARNDR.DLL

SNDLIB.EXE

CUT_SCENES

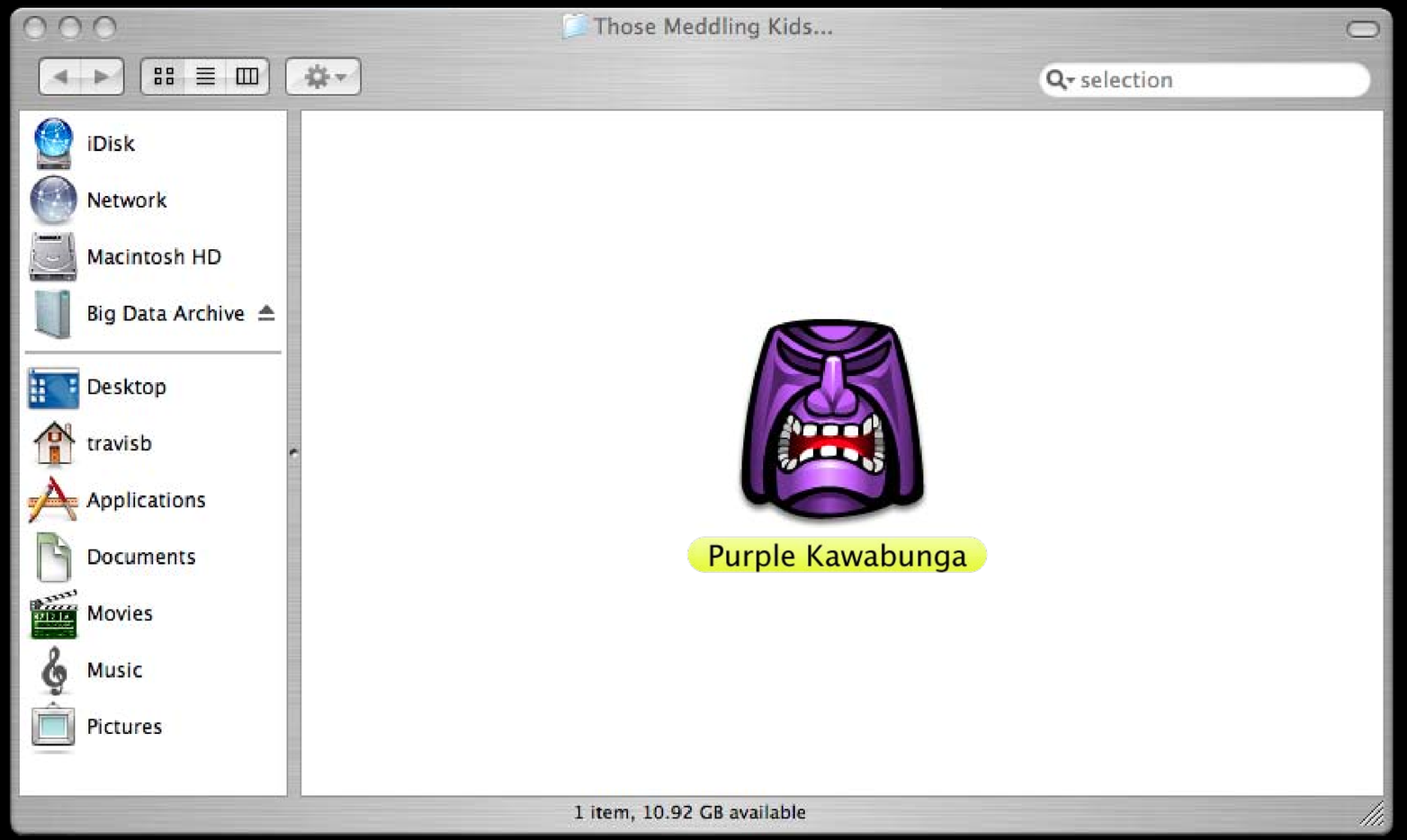
WAVS

PATCHES

DATA

SAVES

Package Your Application



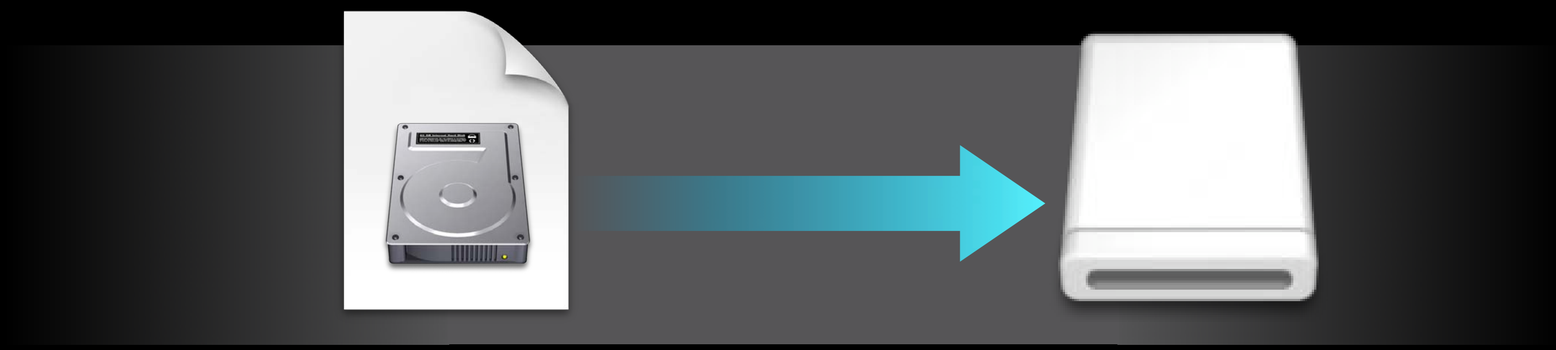
Support Drag Installs

Create Smart Patches and Updates

- Just use compressed disk images (.dmg)
- Avoid compressing the compressed!
  - Example: Compressed Disk Images inside Zip or StuffIt archives
  - Savings of ≈3% not worth the effort
- Avoid multi-step updates
  - Do not provide individual files with a README
  - Use installer to update software

Create Smart Downloads

- Use Internet-Enabled Disk Images
  - Dramatically simplify the download process
  - Minimal user interaction
  - Self clean-up
- See “Distributing Software With Internet-Enabled Disk Images”
  - In Xcode Help’s Reference Library



Integrate with .Mac

- Collaboration and community
  - Distribute special levels and content
- Shared game saves
  - Play from home, work, and on the road
- Publish to Web
  - Rankings, high scores, etc.
- Identity and credentials
  - Use .Mac ID as gamer-tag
- Check out the .Mac 2.0 SDK

.Mac

The Sims 2 Body Shop

Build Sims

Create Parts

Your Sim has been packaged and uploaded to your .Mac Public folder.

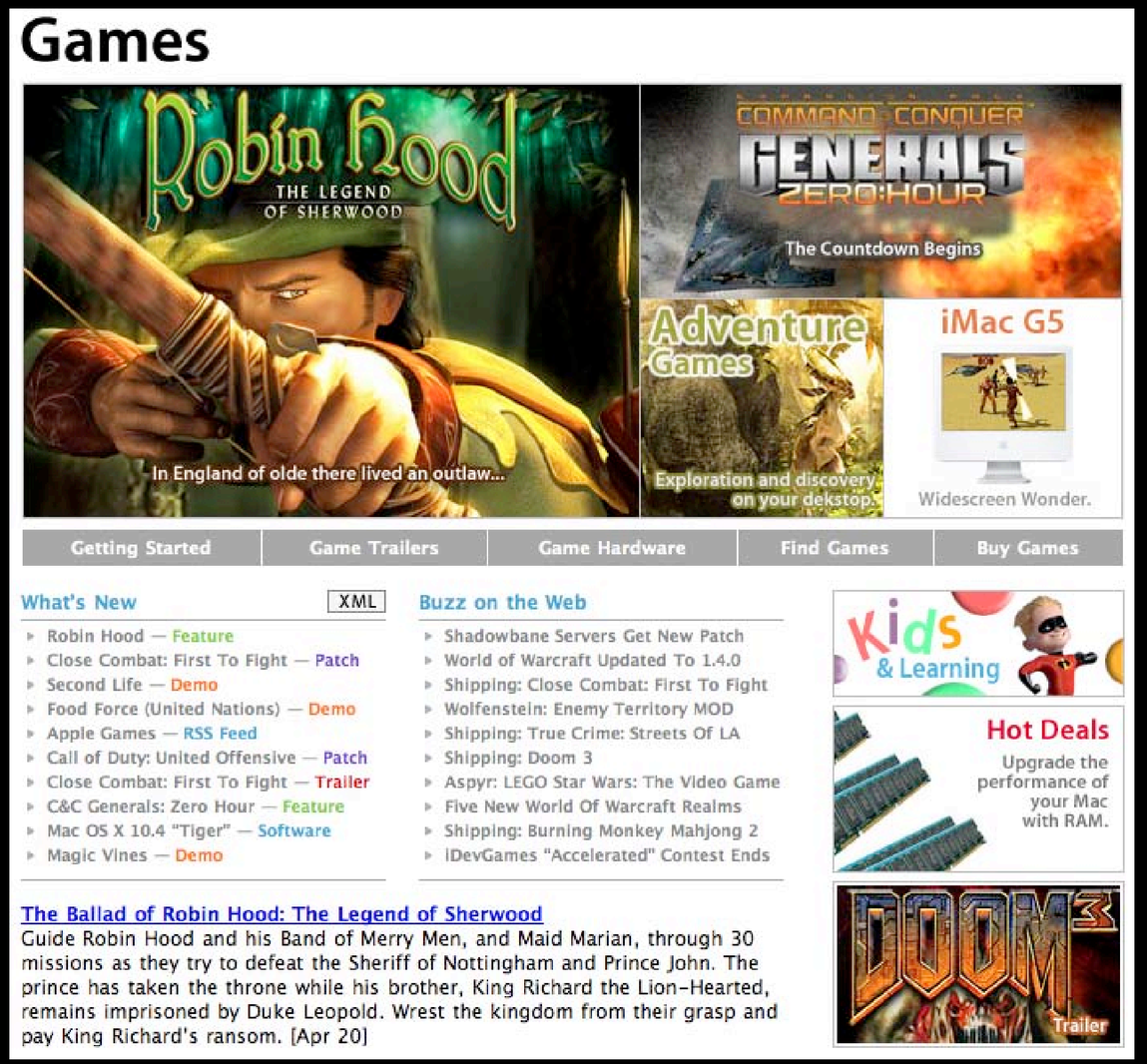
Games Resources

Tim Schaaff

http://developer.apple.com/wwdc2005/

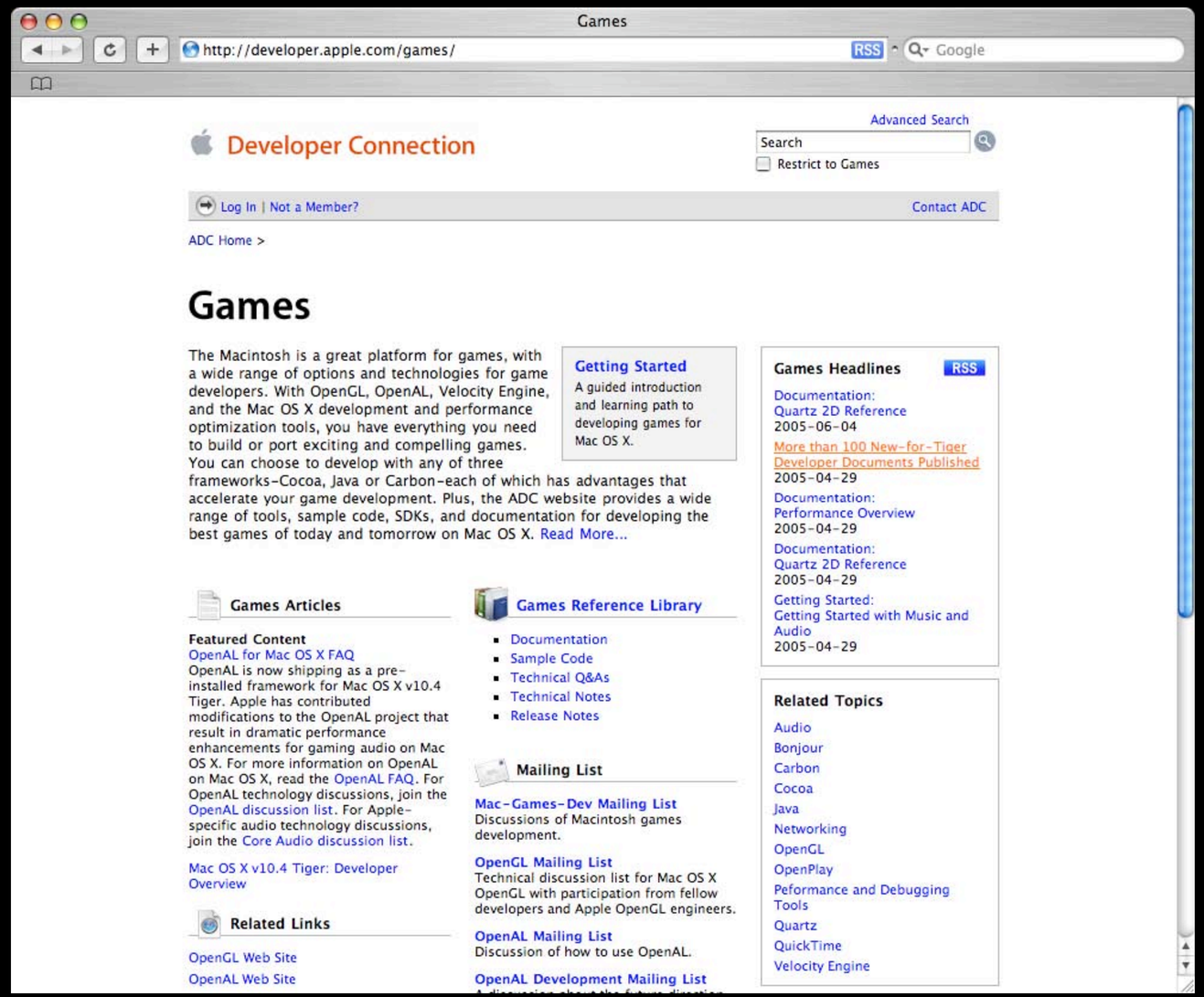
Apple Websites and Newsletters

- apple.com/games
  - #1 games trailer site
- Eight million served
  - Apple eNews
  - QuickTime News
- Apple Start Page
  - Two million visitors a day
- QuickTime Player content guide



ADC Game Developer Website

http://developer.apple.com/games/



Mac Gaming Community

- Inside Mac Games
- Mac Radio
- MacWorld Game Room
- MacGamer
- VersionTracker
- MacUpdate
- MacMinute
- apple.com/games

Related Sessions

Go To Market Strategies	Russian Hill Wednesday 3:30PM

Gaming at WWDC

http://developer.apple.com/wwdc2005/

Games Connection

Third Floor, Moscone West

Games Lunch Talks

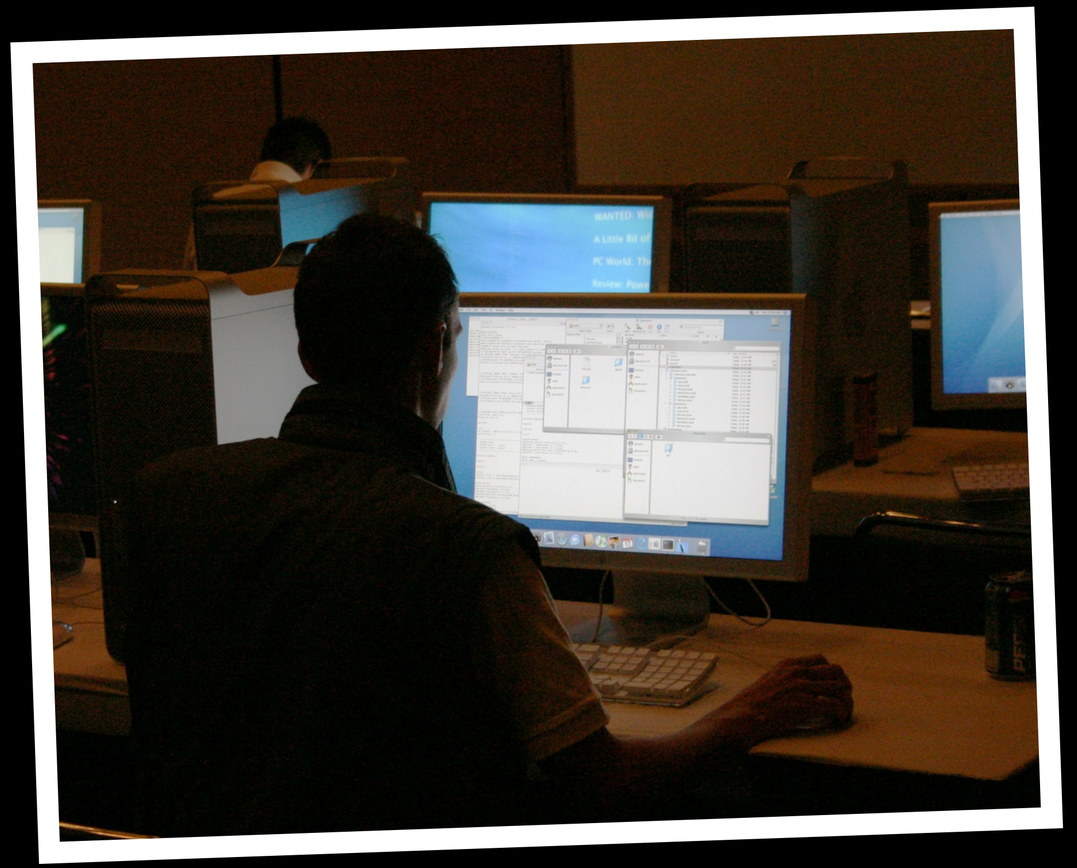
Ageia Physics on Mac OS X	Games Connection Wednesday 12:45PM
The Casual/Downloadable Game Market Explosion	Games Connection Thursday 12:45PM
Games Engines for Mac OS X	Games Connection Friday 12:45PM

Afternoon Interest Groups

Middleware Solutions	Games Connection Wednesday 2:30PM
Casual Games	Games Connection Thursday 2:30PM
Make Your Own Games	Games Connection Friday 2:30PM

Games Code Jam

Wednesday 7:00–9:00PM, Tiger Lab



Mac OS X Tiger

WWDC2005

Worldwide Developers Conference